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Improved reindeer handling.

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IMPROVED REINDEER HANDLING

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INTRODUCTION

The method of handling reindeer in Alaska has within recent years generally changed to conform with modern practices of handling livestock. Formerly, with small-sized herds, the Old-World methods originally introduced by the Laplanders were successfully followed, but with the greatly increased numbers of reindeer, the owners are now finding that the old methods no longer suffice and that new and modern ones must be adopted. Close herding and roping on the open range can no longer be applied, and open herding and the use of improved corrals and chutes are becoming the accepted practices.

HERDING

The reindeer herds, while confined within specific areas, or natural units of range, have definite range habits that guide them from year to year, and the herders follow them as they move about over their home range, or unit. The animals also have definite seasonal movements and are influenced by weather conditions, especially winds, so that by learning the habits of the animals the herders know fairly well where the herd may be found at any given time and under any particular condition of weather prevailing.

Reindeer are attached to their accustomed haunts and when well located on a range will return to it if moved away. This is particularly true of the spring range, the does returning each year to the same fawning grounds. With change in seasons, unless restrained, they instinctively seek their favorite fall, winter, spring, or summer

pastures. In the choice of summer pastures such pests as mosquitoes and flies play an important part, as these insects cause the reindeer to seek the wind-swept areas adjoining the beach along the coast or the wind-swept ridges and low mountain tops in the interior. During the summer they move around a great deal over the range in nervous feeding, but in winter they graze more quietly and remain in one general locality. The rutting season is during September.

Unlike the horse, the reindeer moves against the wind and, especially during the height of the fly season and when a strong wind is blowing, will sometimes travel as much as 15 or 20 miles during a day. In grazing the reindeer feeds two or three hours and then lies down for about the same period of time. Beginning in the fall and continuing during the winter, the animal prefers to feed almost wholly on lichens. In summer it feeds and fattens largely on green herbaceous vegetation. In the evening and early in the morning the animals are more inclined to travel than during the heat of the day and may be driven then more easily. When bunched and being handled, the reindeer mill a great deal, the individual herd always milling in one direction, either clockwise or counterclockwise.

Herding reindeer is now done entirely on foot with the aid of dogs. The introduction, however, of some such hardy animal as the Iceland pony for use in herding is deemed feasible and in time will no doubt be accomplished. The range unit in Alaska is usually from 500 to 750 square miles in extent, the maximum being as much as 1,500 square miles. Consequently, herding over such large areas on foot presents no easy task, and is further complicated by the nature of the range, much of which is wet, hummocky tundra. To hike over this sort of ground for long distances with a pack is grueling work. Formerly, when the herds were small, close herding was practiced, and the reindeer were confined near the villages to make the job easier. With the enlargement of the herds, however, close herding became impracticable, and a new scheme of handling had to be adopted, under which numerous camps were scattered about over the range as centers about which herding was done. As the seasonal shiftings of the herd required, the herders moved from camp to camp. The present practice with the best-handled herds is to construct, in place of temporary tent camps, numerous herding cabins on the range for permanent use, where supplies and equipment can be conveniently stored. The ideal arrangement is to build these cabins near enough together for the herder on any part to be within a day's walk of a cabin and to place them so that convenient patrol of the range boundaries will be possible.

Other aids to better handling of the larger herds will be the construction in some cases of short drift fences, the adoption of a system of salting on interior areas, and particularly the more extensive employment of pack and sled reindeer in hauling supplies and getting over the range. The herder who must carry his own pack is limited in the time he can spend out on the range, and consequently, if the range is large, he may fail to bring in all the stock at round-up time. Furthermore, the difficulty of hiking with a pack over much of the Alaska tundra is not productive of efficient results. By using pack reindeer to carry his supplies, therefore, the herder makes his task

much easier, he is able to stay out on the range a long time, and by being able to cover his range thoroughly is assured of a complete rounding-up of all stock.

More efficient herding is also made possible by consolidating two or more herds where the ranges occupied do not form a sufficient natural unit to keep them separated. With the increase in the numbers of reindeer, it is becoming more and more difficult to keep adjoining herds from mixing, especially where there is not a good natural division between areas. Under such conditions, combining the herds will simplify management and obviate considerable future difficulty.

It should be emphasized that open herding does not imply lax or insufficient herding. It means constant patrol around the herd, but instead of being held in a close band, the reindeer are permitted to graze naturally and spread out over the range. In this way the herding consists chiefly in making a big circle around the band each day without disturbing it, and in working in the few stray animals that get too far away from the outer grazing circle.

ROUNDING-UP

The reindeer are rounded up each summer during July or August for marking, and again in the fall, usually in October, for butchering. Formerly, when the herds were small, the reindeer when rounded up were handled by roping either on the open range or within a crudely constructed inclosure of brush or poles. With the large herds, however, roping is impracticable, the handling is done through a chute, and the fawns are marked on the basis of percentage ownership of female stock.

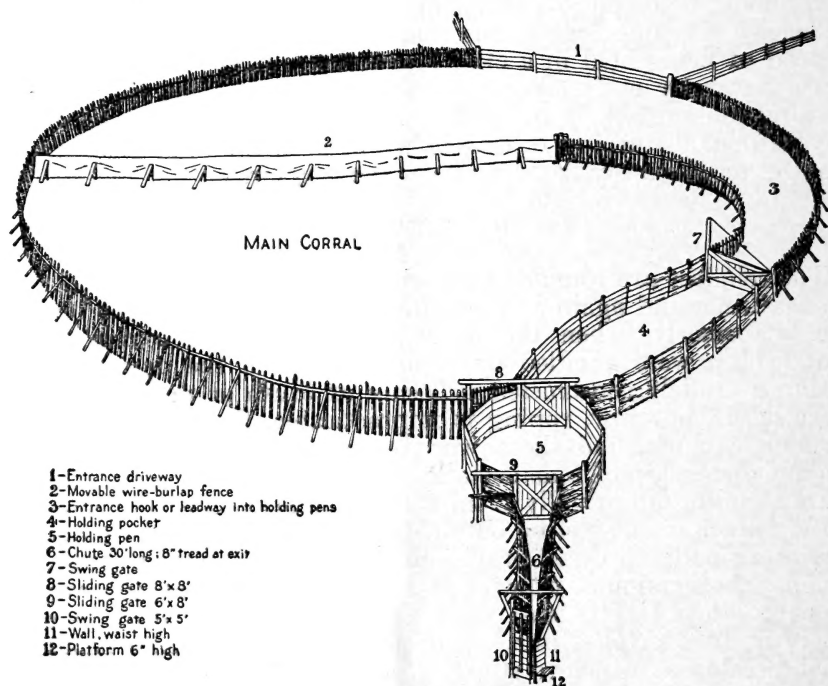
In rounding-up, usually from 6 to 10 herders scour the range for stock. Each man, starting out on foot, is accompanied by a dog and carries a small supply of provisions. As he must pack his own provisions, the maximum time he is able to stay out on the range is about 10 days. The men work separately, each herder camping where night overtakes him. Sometimes he is fortunate enough to reach a cabin at which to stop, but oftener he sleeps out by a camp fire under a tree or on the open tundra. As soon as any reindeer are located they are started in a common direction and kept going toward the corrals until gradually all are brought together. The total herd, which may often number 5,000 or more reindeer, is then grazed within a mile or two of the corrals at night and held closer in during the day until the completion of the work.

Small bands of 1,000 to 2,000 animals are separated from the main herd from time to time as required for handling. Often, while the herd is being held awaiting corralling, small bunches escape at night into the hills. For this reason, in a number of instances reindeer owners are fencing large pastures adjoining the corral in which to hold the herd during the round-up. The type of fence generally constructed is either a 5-foot-high wire-netting fence or one of poles, usually with five panels 1 foot apart.

CORRALLING

CORRALS

Along the Alaskan coast, where most of the herds are located, corrals are usually placed on a dry sand spit adjoining the beach. First, heavy spruce posts are set in the ground and then joined at the top by cross poles approximately 5 feet from the ground. Split spruce poles 7 feet long are then nailed upright, with a slight outward slant, against the cross poles about 2 inches apart, with the lower ends sunk a few inches into the ground. The completed corral wall pre-



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FIGURE 1.—Highly successful corral of the chute type. It is important that the leadway into the holding pens be constructed on the side of the corral to meet the direction in which the herd mills. The movable wire-burlap fence is useful in cutting off bunches of stock from the main herd.

sents a palisade effect. Instead of a regular gate, a portion of the fence is made movable at a place where the animals can be driven in.

The main inclosure, into which the animals are first driven, is circular in shape and from 50 to 75 yards in diameter. A swinging gate at one side leads into a small circular pocket about 10 yards in diameter, a wing or hook being constructed from one side of the gate extending into the main corral to direct the animals into the pocket. At the farther side of this pocket a sliding gate opens into another pocket almost as large, and at the other end of this pocket

¹ Further information on corralling is given in the following: PALMER, L. J. PROGRESS OF REINDEER GRAZING INVESTIGATIONS IN ALASKA, U. S. Dept. Agr. Bul. 1423, 37 p., illus. 1926. (For sale by Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents a copy.)

a second sliding gate opens into a narrow V-shaped chute from 15 to 30 feet long. At the outer end of this is a swinging gate, and opposite the gate a low platform fronted by a wall waist high.

Where the herd is large and there is no fence for holding the animals during the round-up period, a second corral attached to the end of the chute becomes necessary. This corral should be about the same size as the main one, or large enough to hold the number of animals handled in any one day—2,000 to 2,500 head. As fast as the animals are handled they are turned into this corral to be held until the day's work is completed. The bunch is then turned out and driven far enough away to prevent its mixing with the main herd or with those not yet marked. Some mixing, however, is bound to take place when does seek their offspring or fawns their mothers. Consequently, each animal as handled is marked with paint in order to avoid recounting in case some mixing takes place. The animal is given a daub of paint (yellow or green, for example) on its side as it passes through the chute. As fawns are freshly ear-marked, they need not be painted. Under this method, the main corral should be only large enough to hold the number of reindeer that can be handled in one day's work. Nothing is gained by making the corral larger, and furthermore in large corrals it is more difficult to handle the animals when driving them into the pockets.

DRIVING INTO CORRAL

In corralling, a small band is quietly separated from the main herd early in the morning while the reindeer are grazing and are more or less scattered. Does are thus less apt to become separated from their fawns. The small herd is then driven to the corral.

Though more or less like cattle in habit of grazing, when being driven reindeer bunch like sheep and drive almost as readily, except for a tendency to mill. Where one goes the rest follow. In the open reindeer move along with little milling, but when crowded they start to mill.

Wing fences extending out from the entrance to the main inclosure serve to direct the reindeer into the corral. Preferably the entrance driveway should lead upward into the corral. It is interesting to watch the animals as they are crowded toward the inclosure with a line of herders closing in behind and stretching a long strip of burlap between them to discourage escape. Milling around always in the one direction, all are much excited; the mouths of the older animals are open; they are panting and coughing; there is a rustling of snapping ankles; and intermingling with these come the grunting of fawns and the deeper-toned answering calls of the does. Occasionally, a few animals, generally a doe and a fawn leading, will suddenly break away and dash through the line of drivers. Others may note them and follow, but the main herd remains intact, and the few wandering ones, realizing that they have gone away from the rest, usually soon turn back, the herders opening up to let them in. Sometimes, however, they must be brought back by dogging.

By persistent gradual crowding, done quietly and without excitement, the herd is finally brought to the corral entrance. Considerable shouting and gesturing excite the animals and may cause them to stampede. The leaders, seeing the corral opening, suddenly dash

in, and the rest follow. Two or three sled reindeer tied within and to one side of the corral are most valuable in attracting the herd and inducing it to enter. As the reindeer rush into the corral the herders run in behind to line up at the entrance, and the gap in the fence is then closed up. In the corral the herd continues to mill for some time before quieting down.

HANDLING IN CORRAL

The corralled animals are now put through the chute for handling. A crew of about 20 men is usually employed, including 1 tally man, 3 men to mark or brand, 2 men to perform castration, from 8 to 10 men to throw and hold the animals, 2 men on the platform at the end of the chute to catch and pass out animals (1 of these to paint also), 1 gatekeeper at the end of the chute, and 1 or 2 men to tend the pockets. To start work, the gates leading from the main corral into the pockets are opened. Part of the crew then cuts out and drives a small bunch of the reindeer into the pockets, enough to fill them comfortably; then the gates are closed. The men then take their stations, and the gate leading into the chute is opened and two or three animals are driven through, those that remain in the pocket being held in check. The gatekeeper at the outer end of the chute opens the gate, and the animals, seeing a way of escape, rush for freedom. The gate is closed just before they reach it. Each animal is then seized and held by the horns by a man on the platform and passed out singly to the handling crew outside, where the reindeer is thrown and marked or castrated, or both. Animals that have previously been marked are merely recorded by the tally man and allowed to pass through without being caught.

As the man working in the pockets regulates the passing of animals into the chute, upon him depends to a large extent the speed of handling. As soon as the chute is emptied each time, he drives another two or three animals into it, repeating the process until the pocket is emptied. He then closes the gate to the chute while driving more animals in from the other pocket. Work is further facilitated by his calling out the age and sex of the animals passing into the chute to let the handling crew know what is coming. Animals may be handled under this method at the rate of 300 or more an hour.

One man stationed at the end of the chute, either the gatekeeper or one of the men on the platform, is detailed to call out ownership, age, and sex of animals as they pass through. This man should be the best informed on the various ear marks or brands in the herd. The tally man records all animals by ownership, sex, and age as they are called out and also directs to whom unmarked animals shall be allotted.

As the reindeer are passed out at the end of the chute, they are successively grasped by the horns by the men standing in line outside waiting to receive them. Each yearling and fawn is thrown by one man. Yearlings are thrown by grasping the near horn in both hands, the left hand near the end, the right grasping a prong nearer the head. The animal is twisted over on its right side as it struggles. Fawns are grasped by a horn with one hand and by a flank with the other. As they are lifted their feet are thrown from under

them and they fall on their side. The larger, older reindeer must be handled by more than one man, usually three. As the animals reach the end of the chute they are grasped and held by the horns by a man on the platform, the near horn being used as a lever over the low wall fronting the platform. The gate is then opened and the animal grasped by the forelegs by one man. The horns are then pulled over the end of the chute by two men, the animal twisted over and thrown on its side and dragged a few feet away where it is held by another man. A dehorned animal is thrown and held by placing the chest against the animal's side, grasping the off front leg, and, as the animal goes over, placing one leg over its back and the other between its hind legs.

REMOVING DISEASED AND INJURED STOCK²

Losses of reindeer from disease and injury may be reduced to the minimum through improved handling. Such injuries as broken horns and bones usually result from rough or improper handling. Losses from this source may be largely prevented by elimination of roping, the employment of proper corral and chute, and insistence on gentleness in handling.

Reindeer, like domestic livestock, are troubled with parasites and with such bacterial diseases as foot rot. Close and frequent grazing over the same ground predisposes the animals to becoming heavily infested with these parasites and bacteria. Therefore such grazing should be carefully avoided. Where an area has become contaminated, the herd should promptly be moved onto new ground. A sickly animal should not be kept in the herd, and if there is any doubt about its condition it should be killed without hesitation. Great losses through spread of diseases to other animals may often be averted by prompt action of this nature.

PERCENTAGE MARKING

Unmarked stock is distributed among the owners on the basis of percentage ownership of does, including female yearlings. When there is no definite record of ownership, proportionate distribution is made on the basis of the marked does passing through the chute. Once the ownership of a herd is completely established, the marking of fawns from year to year is done on percentage ownership of the previous year, with transfers taken into account. As unmarked yearling females are assigned, they add to the total female stock of the owner and share in the distribution of the fawns.

The percentage on which distribution is based is found by dividing the total number of fawns handled by the total number of does. The number of fawns to which each owner is entitled is found by multiplying this percentage by the number of does recorded for him. A second, and often preferred, method is to divide the total number of does of each owner by the total number of does in the herd and multiply by the total number of fawns or yearlings.

² More detailed information regarding the diseases and parasites of reindeer and their treatment may be found in the following: HADWEN, S., and PALMER, L. J. REINDEER IN ALASKA, U. S. Dept. Agr. Bul. 1089, 75 p., illus. 1922. (For sale by Superintendent of Documents, Government Printing Office, Washington, D. C., at 25 cents a copy.)

When stray animals from adjoining herds pass through the chute, fawns are marked to their owner on the basis of 50 per cent of the stray does handled. Owners of strays do not, however, share in any unmarked yearlings—these are marked and assigned only to recognized owners in the herd.

This assignment of strays has now become a general practice in most sections of the Territory. Usually the fawn crop averages more than 50 per cent, but the margin of difference accruing to the herd is considered as the payment by the owner of strays for the herding and handling of his animals.

In inaugurating the percentage-marking system, owners should first agree on a definite procedure. They should record on paper a list of all transfers to be made in settlement of debts, payment of herding, or exchanges between owners, in order that the tally man may make proper account and correctly instruct the markers. It should also be determined, in certain cases, to what owners the unmarked yearlings shall be distributed, and in what proportion. Con-

SCORE SHEET FOR PERCENTAGE MARKING OF REINDEER

HERD: NONE, NO. 1

DATE: 8-15-28

OWNER	ADULTS			YEARLINGS		FAWNS	
	DOES	BUCKS	STEERS	FEMALES	MALES	FEMALES	MALES
JOHN DOE	III III						
	III III	III I	III III	III	III I	III	III
	III III		III III			III	III
	III II					II	II
FRED SMITH	III II	II	III	I	II	III	III

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FIGURE 2.—Sample tally sheet for use in percentage marking of reindeer as they pass through the chute

troversies regarding ownership and payment of herding expenses should be settled and the final agreement written down for the guidance of the tally man.

Tally sheets should then be prepared, listing the large and small owners and indicating the approximate number owned by each, so far as known. Columns on the tally sheets provide for recording adult reindeer—bucks, does, and steers; yearlings—males and females; and fawns—males and females. As each animal passes through the chute its ownership is noted, and it is recorded by a check mark on the sheet in the proper column opposite the name of the owner. Greater space should be allowed on the tally sheet for the record of the large owners, and large and small owners should be grouped separately. (Fig. 2.)

As unmarked fawns or yearlings appear through the chute the tally man shouts out to whom each shall be marked, and the animal is so recorded. To determine what distribution shall be made he constantly watches his score sheets and assigns ownership of unmarked animals in proportion to the number of does handled.

Ordinarily it may be safely figured that the fawn crop will run about 60 per cent, on the basis of doe stock in the herd. In some of the best handled herds it may be 70 per cent. It is comparatively simple to make a fairly close distribution of the fawn crop among owners as the work progresses.

It is impossible to obtain absolute accuracy in distribution, but a minimum of longs and shorts may be obtained through careful tallying. Following the handling of the first band or two through the corral a good idea may be gained as to about how the fawns will run in number—that is, whether 5, 6, or 7 fawns to each 10 does—and subsequent marking may then be kept more closely in balance. Upon working the last bunch through, greater care should be taken and necessary adjustments made to balance long and short assignments.

The proportion of unmarked animals to does constantly fluctuates as the work progresses during the day, but distribution to conform with this variation is automatically maintained by recording on the basis of does as they appear. For example, if the run through the chute happens to be 10 does to each 5 fawns, each owner as he obtains 2 does is marked 1 fawn; or should the runs be 10 does to each 6 fawns, each owner as 5 does are recorded for him, is marked 3 fawns.

Later, toward the close of each day, totals may be figured and the actual proportion of fawns determined for the entire bunch handled, and on the basis of this percentage further recording may be made to balance as nearly as possible the number of fawns assigned to each owner.

Longs and shorts in number of fawns assigned to the individual owner may be balanced from time to time as rechecks are made of the percentage run of fawns. Rechecks should be made at the close of each day's work, if not oftener, and necessary adjustment made the first thing the next day. At the close of marking, the few longs and shorts remaining are carried over for adjustment and marking at the next year's round-up.

When the herd is being handled, fawns often bunch together, and a large number may come through at once. And it may happen that the fawns come through early before a proportionate number of does have been recorded. When fawns appear faster than does, they may safely be marked to large owners in advance, since it is certain that a sufficient number of does of these owners will come through later on.

In no case should a larger number of fawns be marked in advance for small owners than the tally sheets show them to be entitled to; nor should they be assigned any fawns until adult females are recorded for them.

Early in the marking it is a safe rule never to assign to small owners more than one fawn for each two does handled (50 per cent). Later on, should the percentage be shown as running higher than 50, adjustments can be made to give small owners their proper share.

The same principle also applies to a correct distribution of male and female fawns. Small owners should never be marked ahead either in males or females. Should there be a heavy run of one sex, although they normally run about the same in number, and the owner's quota be filled on that particular sex, then the surplus should be marked in advance for the large owners only. A balance will eventually develop as the work progresses, particularly toward the close of the marking.

Unmarked yearlings are apportioned among the owners in the same way as are the fawns. These include all unmarked animals other than fawns, whether 1 or 2 years old or older. Actually there are four distributions and four percentages to be considered. These are the male and female fawns and the male and female yearlings. Each requires a separate apportionment, although, as stated, the percentage of the sexes in the fawns will run about the same.

The total percentages at the close of the first day's work should be used in distributing fawns the next day and until a further recheck is made. In continuing the marking the next day, however, a balance should first be effected to check off longs and shorts. The second recheck may show 60 or 70 per cent, for example, but whatever it may be, this new figure should be used for the subsequent marking.

Each recheck should be based on the total number of animals previously handled and not on that particular day's work only. Furthermore, with each recheck the increase due each owner should be refigured from the beginning, and a retabulation of longs and shorts should be made for further balancing.

Prior to working the last bunch of reindeer through the chute a final recheck should be made and a balance of longs and shorts obtained to be carried over for correction in the next year's marking.

BRAND REGISTRY

A brand registry law recently put into force in Alaska requires each individual owner to have registered a brand or mark (or both), as is done in the States. Cooperative herds need only the one herd brand or mark, and such brand or mark should be registered under title of the company or association. Ear marks as well as brands should be immediately registered in order that any question of ownership may be settled.

The use of numerous ear marks should be discouraged. Each member of an Eskimo family now uses an individual mark, and the result is a great confusion of marks in the herd; often there are 50 marks or more. Instead of a separate mark for every individual, there should be only one mark for each family or each community, with individual ownership shown by a book record.

CASTRATION

The main reasons for castrating reindeer are to produce steers for meat and to reduce the number of bucks to a proper proportion of the herd, only those being retained that are best suited for breeding purposes. Animals may be castrated either as fawns or as adults. The fawn, however, should be at least 2 months old, so that the testicles will be developed sufficiently for ready handling.

The tools necessary for castrating are a sharp knife and an emasculator, an instrument shaped like a pair of pliers with a broad corrugated crushing surface and a cutting edge. These should be kept in some good disinfectant when not in use, and instruments and hands should be rinsed in it after each animal is operated on.

In castrating, cuts in the scrotum should be made with the knife directly over the middle of each testicle. The testicles are then slipped out through the separate cuts, and removed by severing the

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CORRECTION SLIP

Page 11.—One line should be inserted immediately preceding the last
line of this page, to make the last two lines read as follows:

From 5 to 10 bucks are necessary for 100 does, and the number in the
herd should be kept down to this ratio by castrating. The largest



cord fairly close to the abdomen, with about 1 inch of the cord attached to the testicle. In fawns the cord may be cut by scraping with the knife, but in older animals the emasculator should be used. In opening the scrotum care should be taken to make the cuts clear to the end of it, in order to insure good drainage.

FEEDING

Reindeer may be readily trained to eat hay and grain, and will fatten on it. They are particularly fond of alfalfa but eat the fine parts only, thereby wasting about 50 per cent. Feeding alfalfa meal, therefore (molasses and plain), is more economical. Desirable grains are whole oats, crushed barley, and mixed chop feed. For ordinary feeding the animal will consume about 8 pounds of hay or 4 pounds of meal a day and 4 pounds of grain.

The quickest way to teach a reindeer to like hay and grain is to mix lichens with the new feed for the first couple of days or to sprinkle salt on it. As soon as the animal gets the taste, it is but a short time until it will be eating a full ration. An animal that has been handled previously in any way, as a sled reindeer, will take to the new feed more quickly than the others. It usually takes the average range animal about a week to 10 days to become established on a full ration.

When held in confinement and fed, reindeer should be given salt. Placing a cake of block salt in the corral or inclosure where the animals are held is the simplest method. Water must also be provided where feeding is being done. In winter, snow should be given, as the reindeer prefers taking its water in that form.

BREEDING

For the most part the reindeer in Alaska have been permitted to increase without much attention to breeding, their inferior size and quality in many cases showing evidences of deterioration of stock. These conditions have naturally arisen from the use of unscientific and inefficient methods. Exchange of blood between herds has been more a matter of accident than design, and scrub and inferior animals have been permitted to breed indiscriminately. Such practices can not continue if a worth-while industry is to be built up, and reindeer owners must adopt improved breeding methods if there is to be continued development.

Selective breeding is the first and most important step toward establishing a better grade of stock. Only the best animals should be used for breeding; and all scrub animals, both does and bucks, should be promptly eliminated from the herd. As old does either are unproductive or have weak fawns, it is highly desirable to cull out part of them each year. All stunted, sickly, or otherwise undesirable animals also should be disposed of.

It is especially important that more attention be paid to the selection of herd bucks. At present there are too many undesirable small bucks in service, and in too many cases the larger animals, which should be heading the herds, are castrated and later killed for meat. herd should be kept down to this ratio by castrating. The largest

and best bucks of dark color should be retained for breeding purposes and the remainder grown as steers.

White animals are inferior and should be promptly removed from the breeding herd, the males by castrating and the does by slaughtering. Spotted reindeer, while superior to the white animals, are inferior to the dark ones, and those of the lighter shades may well be disposed of. The distinctly steel-gray reindeer, however, seem to be fully as large and strong as the dark-colored ones and are suitable for breeding. The dark-colored animals are superior, and breeding therefore should be generally toward the dark color.

BUTCHERING

The best time for slaughtering reindeer is in the fall, during October, November, and the first part of December. Steers are at their prime in October and November, although the meat is in almost equally good condition during September and the first half of December. In September, however, rutting is in progress and the herds should not be disturbed. By December 20 the reindeer are beginning to lose their fat and the parasitic warble grubs are developing to a considerable size, so that after that date the meat becomes less and less valuable. In favorable seasons, however, animals may continue in good condition to the middle of January.

Bucks should never be killed for food, as the meat has an objectionable odor and taste and spoils easily. If bucks are to be slaughtered they should be castrated prior to the rutting period, or not later than the middle of August. The animal will then fatten and be in condition to kill later in the season and will not have the strong odor and taste.

Reindeer may be killed either by shooting or by pithing, which consists in stunning the animal with a single oblique thrust of the knife at the back of the neck into the base of the brain. If handled on the open range the animal may best be shot, but if at a modern slaughterhouse and through a chute, pithing is the method employed. Following either shooting or pithing, the throat should be cut immediately, the animal bled, and the gullet tied to prevent regurgitation of the contents of the stomach and resulting contamination of the interior of the dressed carcass. It is probable that the contents of the stomach contain the spores of mold, and these should be prevented from spreading to the carcass. As soon as the throat is cut the carcass should be hoisted to permit prompt and thorough drainage of the blood. The old method of killing by driving a knife through the brisket and into the heart and bleeding the animal internally is inhumane and should not be permitted.

In modern slaughterhouses, the reindeer are passed through a chute onto a platform, where they are killed and bled, and the carcasses are then conveyed through a trap into the slaughterhouse and there hoisted by block and tackle for dressing. Where corral and chute are not available in connection with slaughtering, reindeer may be killed on the open range by shooting, and the carcasses hauled in by sled to a temporary shed or tripod, where they can be hoisted for dressing.

Under the old method of roping in a small inclosure, it has been found that the animals become bruised and excited. Upon butcher-

ing, the result is a poor-looking carcass with bloodshot fat, much reddened meat, and the bruises showing as ugly colored blotches. Reindeer at slaughtering must not be allowed to become bruised or excited and the meat thus heated and blotched. Where butchering takes place on a large scale, this can be prevented by the use of a corral with a chute leading to the slaughterhouse. Shooting the animals on the open range and hauling them in by sled are preferable to roping or crowding in a corral improperly constructed.

In dressing for shipment, the hide may be left on the carcass or it may be removed and the carcass wrapped in cheesecloth and burlap. If the skin is removed, the fresh carcass should be allowed to cool at a temperature of about 38° F. for 36 to 48 hours and then frozen. If the hide is left on, the animal heat does not leave the body so quickly, and therefore a chilling room should be available to cool the animal as soon after slaughtering as possible, particularly in case of mild weather at the time of butchering.

Greatest care should be exercised to keep the carcasses clean. The worst trouble that has arisen in handling reindeer meat is spoilage on account of mold. This can be overcome to a large extent by thorough cleanliness. Carcasses should be kept free from dirt. The man who does the butchering should handle nothing but the carcass. In fully equipped slaughterhouses, portions of the carcasses may be cleansed with running water and a brush.

A most important point in the prevention of mold is to keep the frozen carcasses at a uniform temperature, to give the mold no chance to grow. With fluctuating temperatures in the cold-storage room, mold gains rapid headway, and the meat soon spoils. Furthermore, alternate thawing and freezing injures the cells and thereby lowers the quality of the meat.

MARKETING

The reindeer of the Eskimos furnish meat and skins for the most part to the owners, but a portion of the surplus is sold in local mining camps or in white settlements. Because of the recent great increase in the numbers of reindeer, however, the surplus can not be taken care of locally, and commercial companies are now in the field for the shipping of meat to the States. The Office of Education of the Department of the Interior, also, on behalf of the Eskimos, has been shipping meat to outside markets. This and other reindeer work formerly handled by that office was assigned, effective November 1, 1929, to the Governor of Alaska. Quality of product is one of the most important things to consider in endeavoring to build up a market, and first impressions regarding any new food are strongest. Only the best meat, therefore, properly prepared and handled, should be permitted to reach the market. Spoiled meat must be discarded, and every effort put forth by the reindeer owner and shipper to turn out the best quality of product possible. This can be accomplished only through the adoption of proper methods and a concerted determination on the part of all reindeer owners to follow them.

REDUCING WARBLE AND NOSE FLIES

Warble and nose-grub infestation in reindeer, it is believed, may be lessened by a general application of the methods described below, in

concerted action on the part of reindeer owners. Investigations already made disclose pertinent information regarding the life history of the warble and nose flies responsible for the grubs in reindeer, which is given in Table 1. These studies are being continued in greater detail in cooperation with the Bureau of Entomology of the department.

TABLE 1.—*Observations on warble and nose flies*

Stage	Warble fly	Nose fly
Common emergence of grubs.....	April 22 to June 22 (2 months).....	April 22 to June 7 (1½ months).
Greatest abundance of grubs.....	Latter part of May.....	Middle to latter part of May.
Common appearance of flies.....	June 25 to July 25 (1 month).....	June 15 to July 25 (1½ months).
Greatest abundance of flies.....	First half of July.....	Latter part of June.
Approximate life of fly.....	Female, 4 to 6 days; male, 6 to 9 days.	10 to 13 days.

From Table 1, it will be noted that in the case of the warble the last emergence of grubs is at about the time of the first appearance of the fly, on about June 25, and in the case of the nose grub about June 15. This then suggests a definite period for controlling them. The flies are short lived and do not travel any great distance; therefore, if the herd is moved away from the area where grubs have been dropped prior to any considerable hatching of flies, the herd may largely escape them. The period of emergence of flies of both the nose grub and the warble grub ends about July 25. Consequently, the herd must be held away from the infested area during this time and long enough in addition to insure that the last fly has died, or until the first part of August. The time of emergence of grubs is during the reindeer fawning season, April 15 to June 20. The herd at this time should be closely confined to a definite small area in order to have all the grubs drop in this one place. This area should be located at least 15 miles from the corral site and early summer range and should be used each year only during the two months of fawning and the emergence of grubs. Preferably this location should be inland from the coast, bordering the winter range, so that the grubs will be dropped away from the summer range of one's own herd as well as that of adjoining herds. At the end of the spring period—that is, June 20, which is also the date for beginning the summer round-ups—the herd should be promptly moved at least 15 miles away to the coast for corralling and summer pasturing. Here they should be held at least one and one-half months, or until about August 10. To fix these dates firmly in mind, they may be summarized as follows:

April 15 to June 20— Hold herd on restricted spring range for emergence of grubs.
 June 20 to 25— Move herd 15 to 20 miles away for summer pasturing and for corralling.
 June 25 to August 10— Keep herd 15 to 20 miles away from grub and fly infested area.

It is important that the herd be moved far enough away, not only from its own fawning ground but also from that of adjoining herds, to obtain as complete protection as possible by this means. Along the coast in most cases this will necessitate holding the herds 15 to

20 miles inland from the coast for fawning, instead of bringing them to the coast as formerly. In selecting the spring range, it might be well for owners of adjoining herds to plan their layouts together and perhaps choose adjoining localities. This will tend to concentrate the infestation and to insure that, when leaving one grub-infested area, the reindeer will not be approaching another on an adjoining range.

Salting the fawning ground is suggested as an aid to holding the herd inland. Salt is particularly desired by the reindeer in spring and should therefore prove an inducement for them to remain in the locality. About 1 pound of salt for each animal would be required during the spring period. This salt should be delivered to the area by reindeer or dog sled during winter.

Efforts to reduce the number of warble and nose grubs in reindeer will be amply repaid in the better condition of the animals and the production of cleaner hides. Reindeer hides free from grub holes have considerable market value. Irritation of the animal by the presence of flies and grubs results in loss of weight. Remove this irritation and the animal will gain rapidly in weight and produce better meat.

USE OF SLED REINDEER

The desirability of using pack and sled reindeer in handling the herd has already been indicated. The use of sled reindeer is not common in Alaska, whereas it should be an important factor in the handling of every herd. The dog team is best suited for the main trails and for travel along the coast, but for cross-country travel and for use in the reindeer herd, the sled reindeer would be much more practical and economical. For each 1,000 reindeer in the herd there should be at least 10 well-trained sled or pack reindeer. They may be used effectively in traveling over the range, hauling supplies to camps, following up the herd or making drives, and for use as leaders in corralling the herd. They forage for themselves on the open range and obviate the necessity of carrying feed, other than a small quantity of grain when on long trips or when they are continuously used. Also, the presence of several tame sled reindeer in the herd is of great value in the better domestication of the herd and makes its handling easier.

Training sled reindeer may be greatly simplified by keeping them in a barn or inclosure at the headquarters camp, instead of staking them out on the range, the necessary feed being gathered in fall and stored at the camp for winter use. Likewise, gathering lichens and storing them at the villages will facilitate handling the draft animals when the immediately surrounding lichen range has been depleted.

RANGE USE

The purpose of lichens in the scheme of reindeer raising is to furnish the animals winter forage. They are unnecessary and undesirable for summer feeding, as it is on the succulent green herbage and browse, and not on lichens, that reindeer fatten during the summer months. Furthermore, in summer lichens are dry, brittle, and easily destroyed, and as it requires a depleted lichen range from 15

to 25 or more years to recover, the importance of conserving it is apparent.

Accordingly, for proper range management it is imperative that reindeer owners see that their grazing areas are used at the right seasons and particularly that the lichen areas are protected against summer grazing. Lichens are necessary for the winter food supply and must be conserved for that purpose. Continuous and careless use of such forage in summer would be disastrous to the future of reindeer grazing, and for this reason great care should be exercised in keeping the herds on the summer ranges away from the lichen areas so far as practicable. The summer ranges comprise those areas of chiefly herbaceous vegetation, such as sedges, browse, weeds, and grasses.

The desirable scheme is to divide the range unit into four suitable areas for seasonal grazing and then to use them only at the proper time of year. These areas are (1) fall range, containing a mixture of lichen and nonlichen forage; (2) winter range, containing a maximum quantity of lichen forage; (3) spring or fawning range, providing abundant fresh green growth and giving protection from severe weather conditions; and (4) summer range, comprising chiefly a sedge and browse cover and offering some protection from flies and mosquitoes. The number of reindeer to be grazed on these areas must conform with their carrying capacity. For the average winter range this is approximately 20 acres for each reindeer; for the fall range, about 10 acres; and for the spring and summer ranges about 5 to 6 acres. Yearlong, the requirement is from 35 to 40 acres a head.

RANGE FIRES

One of the greatest sources of injury to range and of losses of forage in Alaska is from fires. Sometimes they are deliberately set, but in most cases they are due to acts of carelessness, such as leaving a camp fire burning or tossing away a lighted match or cigarette. Damage to range by fire involves not only loss of forage and trees, but also of game and fur animals, since the small terrestrial animals are destroyed as well as the cover of vegetation. The damage to lichen range is particularly serious, since it may take a burned-over lichen area as much as 25 and more years to recover; or if it is so badly burned as to destroy the cover of humus, the changed site conditions may result in a recovered stand of inferior species or virtually in a permanent removal of the lichens, as far as practical grazing use is concerned. In view of the importance of the lichen areas for winter grazing, it is vital to all reindeer men to guard against fires; and because of the damage to game and fur animals and to tree growth it is the concern of everyone that fires be prevented and fire protection sought.

SUMMARY

The principal practices to be adopted in the improved handling of reindeer may be listed as follows:

Employment of open herding.

Combination of herds under one management on closely adjoining areas, where it is difficult to maintain the herds separately because of lack of sufficient natural division between ranges.

Construction of range improvements, especially herding cabins and in some cases short drift fences.

Employment of improved corral and chute in handling the herd at round-up time for marking, castration, and separating; eliminating roping as much as possible.

Construction of a large holding pasture adjoining the corrals in which to keep the herd during the round-up.

Reduction of losses through attention to diseased and injured animals.

Marking fawns on the basis of percentage ownership of female stock; in the case of strays from adjoining herds, marking fawns to the owner on the basis of 50 per cent of the females passing through the chute.

Prompt registration of brand or ear mark; elimination of numerous marks through adoption of one common mark for a family or community.

Castration by use of knife and emasculator.

Elimination from the breeding herd of scrub stock, both male and female, and of barren does.

Reduction of herd bucks to the proportion of 5 to 10 for each 100 does.

Selection of largest and best bucks of dark color for breeding purposes.

Elimination of white and spotted animals of the lighter shades from the breeding herd.

Butchering by humane methods and at right time of year.

Emphasizing quality of product and permitting only the best meat to reach the market.

Reduction of warble and nose-grub infestations to a minimum.

Salting on interior areas.

Use of sled and pack reindeer in handling the herd.

Training and keeping in the herd at least 10 sled reindeer for each 1,000 head of stock.

Proper seasonal use of range, and careful attention to the use of lichen areas.

Guarding against range fires and combating them when they occur.

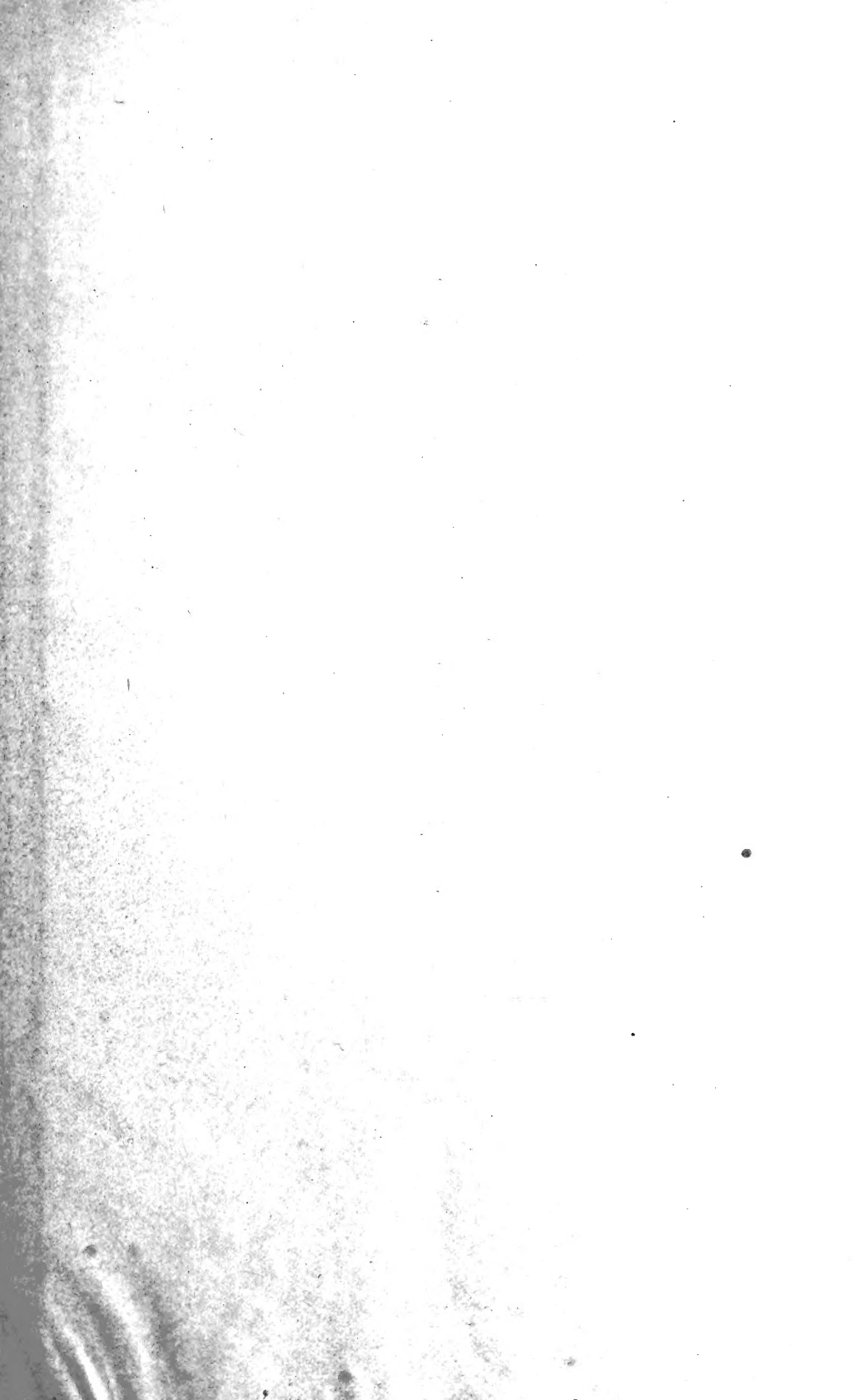
ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE

October 26, 1929

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